Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	097	MTH 097 07/31/2019-Foundations of Algebra
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Math & Engineering Studies	Robert Hatcher
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   Winter 2015

2. Briefly describe the results of previous assessment report(s).

   Two of the three outcomes met the standard of success. Success was defined as 75% of students achieving an average of 3 or better on questions related to the objective.

   Outcome 1: Represent and solve linear equations - standard of success was met.

   Outcome 2: Solve systems of two linear equations - standard of success was not met.

   Outcome 3: Represent and solve quadratic equations - standard of success was met.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   Our student population needed to improve in the following areas:

   - Finding an equation of a line given two points on the line
   - Finding an equation of a line given a point on the line and a parallel line
   - Solving systems line linear equations with elimination and substitution

II. Assessment Results per Student Learning Outcome

Outcome 1: Represent and solve linear equations graphically, analytically and verbally.

- Assessment Plan
    - Assessment Tool: Common departmental final exam.
    - Assessment Date: Fall 2021
    - Course section(s)/other population: Common final exams will be collected from all sections.
    - Number students to be assessed: A random sample of at least 75 exams with at least 4 student exams from each section
    - How the assessment will be scored: A rubric developed by the course mentor with input from the department
    - Standard of success to be used for this assessment: 75% of the students will score 75% or higher
    - Who will score and analyze the data: The course mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2018		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	94

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

As the task of grading all 197 final exams submitted by faculty would be overly tedious, 94 exams were graded. This should be enough to attain an accurate view of the performance of the population of 333 students. In addition, not all students enrolled in the course take the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

None of the sections of MTH 097 offered are DL or MM. All students in all sections were given 11 common questions created by the department. These common questions were included on a paper and pencil final exam. 197 final exams were submitted, and 94 of these exams were selected at random for assessment.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Questions 1, 2, 3, 4, 5, 6, and 7 on the common final exam were used to assess this outcome. All questions were graded on a scale from 0 to 4 (0-problem not attempted; 1-problem attempted with little supporting work; 2-problem attempted with some supporting work; 3-problem solved with one or two small errors; 4-problem solved correctly).

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Overall results: On questions 1 thru 7, 87.1% of the responses (573 out of 658) earned a 3 or better. This passes the standard of success for this outcome.

In addition, the standard of success was also achieved for each individual question.

Question 1: 90.4% (85 of the 94) of students earned a 3 or better.

Question 2: 95.7% (90 of the 94) of students earned a 3 or better.

Question 3: 86.2% (81 of the 94) of students earned a 3 or better.

Question 4: 86.2% (81 of the 94) of students earned a 3 or better.

Question 5: 79.8% (75 of the 94) of students earned a 3 or better.

Question 6: 80.9% (76 of the 94) of students earned a 3 or better.

Question 7: 90.4% (85 of the 94) of students earned a 3 or better.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students performed very well on this outcome. Not only has the success rate for all the questions increased (76.1% in Winter 2015 to 87.1 % in Fall 2018), but the success rates for individual questions went up as well.

The exception is for question 2 involving solving a linear equation that may necessitate the distributive property. This question had a very high success rate of 97.5% in Winter of 2015 and a success rate of 95.7% in Fall 2018. Although this rate went down, 95.7% is still considered an overwhelming success.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The improvement of student understanding in this area from Winter 2015 to Fall 2018 indicates that we should keep on the path we have established. Creating opportunities for full and part-time instructors to share ideas of how to teach difficult topics and create student success.

Outcome 2: Solve systems of two linear equations graphically and analytically.

- Assessment Plan
    - Assessment Tool: Common departmental final exam.
    - Assessment Date: Fall 2021
    - Course section(s)/other population: Common final exams will be collected from all sections.
    - Number students to be assessed: A random sample of at least 75 exams with at least 4 student exams from each sections
    - How the assessment will be scored: A rubric developed by the course mentor with input from the department
    - Standard of success to be used for this assessment: 75% of the students will score 75% or higher
    - Who will score and analyze the data: The course mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2018		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	94

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

As the task of grading all 197 final exams submitted by faculty would be overly tedious, 94 exams were graded. This should be enough to attain an accurate view of the performance of the population of 333 students.

In addition, not all students enrolled in the course take the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

None of the sections of MTH 097 offered are DL or MM. All students in all sections were given 11 common questions created by the department. These common questions were included on a paper and pencil final exam. 197 final exams were submitted, and 94 of these exams were selected at random for assessment.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Question 8 on the common final exam was used to assess this outcome. All questions were graded on a scale from 0 to 4 (0-problem not attempted; 1-problem attempted with little supporting work; 2-problem attempted with some supporting work; 3-problem solved with one or two small errors; 4-problem solved correctly).

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
83.0% (78 out of 94) of students earned a 3 or better on this question.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Performance on this outcome has increased from 72.2% in Winter 2015 to 83% in Fall 2018. It is very encouraging to see that we have hurdled the standard of success on this topic from the last assessment.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Again, the upward trend in student understanding is encouraging. We plan to stay on the same course of providing space for instructors to share best practices.

Outcome 3: Add, subtract, multiply, and factor polynomial expressions.

- Assessment Plan
    - Assessment Tool: Common departmental final exam.
    - Assessment Date: Fall 2021
    - Course section(s)/other population: Common final exams will be collected from all sections.
    - Number students to be assessed: A random sample of at least 75 exams with at least 4 student exams from each section
    - How the assessment will be scored: A rubric developed by the course mentor with input from the department
    - Standard of success to be used for this assessment: 75% of the students will score 75% or higher
    - Who will score and analyze the data: The course mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2018		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	94

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

As the task of grading all 197 final exams submitted by faculty would be overly tedious, 94 exams were graded. This should be enough to attain an accurate view of the performance of the population of 333 students.

In addition, not all students enrolled in the course take the final exam.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

None of the sections of MTH 097 offered are DL or MM. All students in all sections were given 11 common questions created by the department. These common questions were included on a paper and pencil final exam. 197 final exams were submitted, and 94 of these exams were selected at random for assessment.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Question 10 on the common final exam was used to assess this outcome. All questions were graded on a scale from 0 to 4 (0-problem not attempted; 1-problem attempted with little supporting work; 2-problem attempted with some supporting work; 3-problem solved with one or two small errors; 4-problem solved correctly). The mean score from each question was calculated.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
88.3% (83 out of 94) of students earned a 3 or better on this question.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

In the assessment from Winter 2015, the success rate was 82.3% and in Fall of 2018, it was 88.3%.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Again, the upward trend in student understanding is encouraging. We plan to stay on the same course of providing space for instructors to share best practices.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

Sessions where all instructors who teach the course were invited to share best practices, lesson studies on specific topics and informal email discussions are all seen as tools that led to improved performance on the outcomes for the course.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

As students are achieving the course outcomes, an investigation of how our MTH 097 students perform in the next math course will be an area of inquiry in the next assessment report. There are few (if any) courses on campus outside the math department that require MTH 097, so student success in their next math course is a significant measure of success.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

This information will be shared with the faculty with the instructors who attend the full department meeting during August 2019 in-service. It will be discussed further in the mathematics department meeting during the Fall 2019 semester.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Other: Instructor collaboration	Continue creating opportunities for full and part-time instructors to share ideas for teaching difficult topics and encouraging student success.	These opportunities seem to have led to improved performance for the current assessment and will continue to help students improve in the course.	2020

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

Assessment Data F2018

Faculty/Preparer:	Robert Hatcher	**Date:** 08/07/2019
Department Chair:	Lisa Manoukian	**Date:** 08/12/2019
Dean:	Victor Vega	**Date:** 09/26/2019
Assessment Committee Chair:	Shawn Deron	**Date:** 11/08/2019

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	097	MTH 097 05/19/2015-Foundations of Algebra
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Mathematics	Robert Hatcher
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Represent and solve linear equations graphically, analytically and verbally.

- Assessment Plan
  - Assessment Tool: Common final exam created by the department.
  - Assessment Date: Winter 2011
  - Course section(s)/other population: sample of at least four from 12 sections
  - Number students to be assessed: All students in selected sections (approximately 50)
  - How the assessment will be scored: departmentally-developed rubric
  - Standard of success to be used for this assessment: 75% of the students will achieve an average of 3 or better on the assessment.
  - Who will score and analyze the data: Members of the Math Department will blind-score each test item and analyze the data.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2015	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
618	79

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Of the 354 exams that were turned in, a sample of 79 student exams werre assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

None of the sections of MTH 097 offered at the college are DL or MM. All students in all sections were given 11 common questions on the paper and pencil final exam created by the department. 354 exams were turned in from approximately 24 of the 29 existing sections of the course. 79 of the 354 were selected at random.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Questions 1, 2, 3, 4, 5, 6, and 7 on the common final exam were used to assess this outcome. All questions were graded on a scale from 0 to 4 (0 problem not attempted; 1 problem attempted with little supporting work; 2 problem attempted with some supporting work; 3 problem solved with one or two small errors; 4 problem solved correctly).

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Overall results: On questions 1 thru 7, 76.1% of the responses (421 out of 553) earned a 3 or better. However, there is some work to do with individual questions (#4 thru 7). Individual Results: Question 1: 83.5% (66 of the 79) of students earned a 3 or better. Question 2: 97.5% (77 out of 79) of students earned a 3 or better. Question 3: 78.5% (62 out of 79) of students earned a 3 or better.

Question 4: 73.4% (58 out of 79) of students earned a 3 or better.

Question 5: 65.8% (52 out of 79) of students earned a 3 or better.

Question 6: 60.8% (48 out of 79) of students earned a 3 or better.

Question 7: 73.4% (58 out of 79) of students earned a 3 or better.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students' work included in the assessment demonstrated deep understanding of solving linear equations and graphing linear equations (questions 1 thru 3).

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students need the most work on finding equations of lines given two points on the line and given a parallel line and a point on the line (question 5 and 6).

Outcome 2: Solve systems of two linear equations graphically and analytically.

- Assessment Plan
    - Assessment Tool: Common final exam created by the department.
    - Assessment Date: Winter 2011
    - Course section(s)/other population: sample of at least four from 12 sections
    - Number students to be assessed: All students in selected sections (approximately 50)
    - How the assessment will be scored: departmentally-developed rubric
    - Standard of success to be used for this assessment: 75% of the students will achieve an average of 3 or better on the assessment.
    - Who will score and analyze the data: Members of the Math Department will blind-score each test item and analyze the data.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2015	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
618	79

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Of the 354 exams that were turned in, a sample of 79 student exams were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

None of the sections of MTH 097 offered at the college are DL or MM. All students in all sections were given 11 common questions on the paper and pencil final exam created by the department. 354 exams were turned in from approximately 24 of the 29 existing sections of the course. 79 of the 354 were selected at random.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Question 8 on the common final exam was used to assess this outcome. All questions were graded on a scale from 0 to 4 (0 problem not attempted; 1 problem attempted with little supporting work; 2 problem attempted with some supporting work; 3 problem solved with one or two small errors; 4 problem solved correctly).

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No
72.2% (57 out of 79) of students earned a 3 or better.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students who solved the systems with matrices and row reduced the matrices on their calculator performed quite well on this outcome.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We need to work on solving systems with the elimination (addition) method and the substitution method. Our department will hold workshops with instructors of MTH 097 in the 2015-2016 academic year to discuss best practices in teaching this topic along with weaknesses in outcome 1.

Outcome 3: Represent and solve quadratic equations and functions analytically.

- Assessment Plan
    - Assessment Tool: Common final exam created by the department.
    - Assessment Date: Winter 2011
    - Course section(s)/other population: sample of at least four from 12 sections
    - Number students to be assessed: All students in selected sections (approximately 50)
    - How the assessment will be scored: departmentally-developed rubric
    - Standard of success to be used for this assessment: 75% of the students will achieve an average of 3 or better on the assessment.
    - Who will score and analyze the data: Members of the Math Department will blind-score each test item and analyze the data.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2015	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
618	79

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Of the 354 exams that were turned in, a sample of 79 student exams werre assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

None of the sections of MTH 097 offered at the college are DL or MM. All students in all sections were given 11 common questions on the paper and pencil final exam created by the department. 354 exams were turned in from approximately 24 of the 29 existing sections of the course. 79 of the 354 were selected at random.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Question 10 on the common final exam was used to assess this outcome. All questions were graded on a scale from 0 to 4 (0 problem not attempted; 1 problem attempted with little supporting work; 2 problem attempted with some supporting work; 3 problem solved with one or two small errors; 4 problem solved correctly). The mean score from each question was calculated.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
82.3% (65 out of 79) of students earned a 3 or better.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students performed quite well on this outcome. This is an important result for students moving on to MTH 169.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

It seems that this topic is well covered, but we could include more complicated factoring polynomials problems in future master syllabi changes.

II. Course Summary and Action Plans Based on Assessment Results

1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

Overall, students who take the final appear to be successful in the course. Areas for improvement include: 1. Finding equations of lines. 2. Solving systems of linear equations by the substitution method or addition method.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

This information was shared with the part-time instructors of MTH 097 at our full math department meeting during August 2015 in-service. It will be discussed further in a department meeting during the Fall 2015 semester.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
No changes intended.			

4. Is there anything that you would like to mention that was not already captured?

5.

III. Attached Files

Common Final Exam Questions
097 Assessment Data 8.2015

Faculty/Preparer:	Robert Hatcher	**Date:**	09/10/2015
Department Chair:	Lisa Rombes	**Date:**	10/19/2015
Dean:	Kristin Good	**Date:**	10/20/2015
Assessment Committee Chair:	Michelle Garey	**Date:**	11/09/2015